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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20

Application Number: 09/679,096
Filing Date: October 04, 2000
Appellant(s): AISENBERG ET AL.

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GROUP 3700

David A. Fox
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 9, 2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 41-43 are allowed.

This appeal involves claims 36-40.

(4) Status of Amendments After Final

No amendment after final has been filed. The appealed claims are under non-final rejection and have been twice rejected.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Upon further reconsideration, the examiner has decided to allow claim 42; therefore, the rejection of claim 42 is no longer applicable in the instant appeal.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 36, 37, and 38-40 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

4,634,839	GILBERTSON	1-1987
4,327,278	TOMARO	4-1982
5,841,943	NOSENCHUCK	11-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbertson in view of Tomaro and further in view of Nosenchuck. This rejection is set forth in prior Office Action, Paper No. 18.

(11) Response to Argument

A. The Claimed Limitation of the Air Flow Rate No Less Than 18,000 Linear Feet Per Minute is Obvious to One of Ordinary Skill in the Art in View of the Combination of Gilbertson, Tomaro, and Nosenchuck

Patentability of claim 36 turns on whether the cited prior art to Gilbertson, Tomaro, and Nosenchuck teaches or suggests the claimed limitation of the airflow rate equaling 18,000 linear feet per minute (fpm) or greater. While admittedly Gilbertson does not expressly teach this precise airflow rate, as will be explained in detail below, the combined teachings of Tomaro and Nosenchuck, provide ample suggestion to provide such an airflow rate.

As a starting point, the examiner turned to the appellant's own specification for guidance as to exactly how the claimed airflow rate was achieved. See Non-final Rejection mailed 10/21/02, Paper 18, Page 2 ("the Non-final Rejection"). According to the instant specification on Page 17, lines 10-13, Appellant notes that in order to achieve the claimed airflow rate of 18,000 linear feet per minute (fpm), "the motor driving the blower 12 should be a high speed motor having fan blades that rotate at greater than 15,000 rpm." (emphasis added.) Therefore, according to Appellant, the motor rotation rate being above 15,000 rpm is a key factor in achieving the claimed airflow rate.

The examiner relied on this clear teaching emphasizing the critical relationship between the airflow rate and blower motor rotation speed. While Gilbertson does not expressly state the rotation rate of his blower motor, the use of blower motors with a rotation rate in excess of 15,000 rpm in electrically heated blowers to achieve a high-

speed airflow for enhanced convective heating purposes is well known to those of ordinary skill in the art. Indeed, Appellant even seems to admit this fact in the instant specification.[1]

In any event, Tomaro discloses an electrically heated air blower with a 19,000 rpm motor 40 that rotates the fan. See col. 2, lines 55-58. Given Tomaro's teaching, the examiner then concluded it would have been obvious to one of ordinary skill in the art to use a blower motor with a rotation rate in excess of 15,000 rpm (e.g., such as a 19,000 rpm motor) so that a high airflow rate could be achieved.

But the examiner did not stop there. Tomaro is admittedly silent regarding the actual airflow rate achieved with his 19,000 rpm motor. Thus, while it was clear to the examiner that a high airflow rate was achievable with a 19,000 rpm motor, it was unclear exactly how high an airflow could be achieved and whether it would meet the claimed 18,000 fpm limitation. It was for this reason that the examiner relied on the teachings of Nosenchuck to resolve this issue.

For a standard handheld electrically-heated air blower, it is likely that motor speed alone will not necessarily achieve an airflow rate of 18,000 fpm. However, as admitted by Appellant in the instant specification, the motor rotation rate in excess of 15,000 rpm is apparently critical to achieving the desired airflow rate. Based on this apparent criticality, the examiner reasonably concluded that motor speed is a substantial factor in achieving a desired flow rate. See the Non-final Rejection, Page 3.

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[1] See the instant specification, at Page 17, lines 16-18 ("Present blow-off dryers may use such blowers [with airflow no less than 18,000 fpm] but not in combination with an internal heater or with the range of air outlet sizes and shapes described above.") (emphasis added.).

Nevertheless, other engineering factors involving principles of aerodynamics and fluid mechanics can be taken into account to achieve a desired airflow rate. These factors include the choice of (1) the shape of the dryer housing and outer duct, (2) the axial length of the annular duct, (3) the variation in area of the annular duct, (4) the number of stator and rotor stages, and (5) the shapes and number of blades. Nosenchuck at col. 7, lines 45-54. The choice of these factors "are all capable of being chosen by those skilled in the art using known principles of aerodynamics and fluid mechanics." Id. at col. 7, lines 48-54.

The starting point in the engineering analysis is the equation expressed in col. 7, line 65 of Nosenchuck. The equation determines the dryer's heat output, and is equal to the product of (1) the mass flow of air through the dryer, (2) the heat capacity of air (a constant), (3) and the temperature increase over the ambient temperature of air exiting the dryer (set by industry standards, such as Underwriters Laboratories). Id. at col. 7, line 59 - col. 8, line 5. Accordingly, given a desired heat output and standard exit temperature, the air mass flow required to achieve this heat output can be calculated. See, e.g., Nosenchuck's calculation in col. 7, lines 5-8. In making this calculation, Nosenchuck emphasizes there are engineering reasons why the exit velocity of the airflow needs to be a certain minimum value. Id. at col. 8, lines 38-41. In addition, other factors can then be determined affecting airflow rate, such as the shape and number of the fan blades (col. 8, lines 14-23), the airflow envelope (col. 8, lines 35-42), and the dimensions of the airflow ducts (col. 8, lines 42-53).[2]

[2] In addition to the engineering factors affecting the heat output described by Nosenchuck, he also notes that commercial dryers have motors with high rpm values directly affecting airflow rate through the dryer ("[C]ommercial hair dryers today typically run at speeds of about 10,000 rpm, and sometimes even

In light of the detailed engineering analysis procedure described by Nosenchuck employing well-known aerodynamics and fluid mechanics principles, the examiner then concluded that it would have been obvious to one of ordinary skill in the art to so design the Gilbertson blower with a 15,000 rpm motor (as suggested by Tomaro) to achieve the claimed 18,000 fpm airflow rate. Indeed, utilizing Nosenchuck's equation and varying any or all of the previously-described engineering factors, one of ordinary skill in the art would achieve the claimed airflow rate given a desired dryer heat output. Therefore, the choice of such factors would have been obvious to one of ordinary skill in the art to achieve the claimed airflow rate.

B. The Selection of the Engineering Factors to Achieve the Claimed Airflow Rate is Tantamount to Routine Experimentation and Optimization

As an alternative ground of obviousness, the examiner noted in the Non-final Rejection that the choice of the engineering factors (see supra Part A. above) would be tantamount to routine experimentation and optimization. See Page 4, Non-final Rejection. It is well settled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233,235 (CCPA 1955).

Here, choosing the specific parameters of other factors influencing airflow rate such as fan blade size, angle, and the like to maximize the flow rate of aspirated air in a heated air blower is well within the parameters of routine experimentation. Furthermore, while the specific (1) outlet size, (2) outlet length, (3) air jet pressure, and (4) air jet

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higher.") (emphasis added.) Nosenchuck, col. 7, lines 40-42. While it is unclear how high an rpm value Nosenchuck envisions by the phrase "sometimes even higher," it is reasonable to presume such values

temperature are not specified, choosing the optimum dimensions for the outlet, air jet pressure, and air jet temperature to achieve a desired convective heating effect is well within the level of one of ordinary skill in the art. One of ordinary skill in the electric heating art is a mechanical or electrical engineer with at least five years of related industry experience.

Appellant attempts to distinguish the instant invention from Aller in contending that the case stands for the proposition that only changes in degree are not patentable--not changes in kind. (Brief at 4, 5.) Appellant then argues that because the instant invention involves a change in "kind" of drying (blow-off and evaporation), as opposed to a change in "degree"--the examiner's reliance on Aller is misplaced.

Notwithstanding the argument that the change in "kind" of drying claimed by Appellant (blow-off and evaporation) results merely from a change in "degree" of convection heating airflow issuing from the blower, the examiner emphasizes that ultimately the dryer's heat output and associated airflow rate achieve Appellant's desired results. Arguably the Gilbertson/Tomaro dryer alone would achieve Appellant's "change in kind" of drying in view of its 19,000 rpm motor in conjunction with its structure. Nevertheless, selecting and varying the engineering factors described above would necessarily achieve Appellant's desired results and thus a change in "kind" of drying. Indeed, given the educational level and experience of one of ordinary skill in the art (an engineer with at least five years of related industry experience) with a fundamental knowledge of convective heat transfer principles, one of ordinary skill in the

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would be commensurate with those of the instant invention.

art would logically infer that merely increasing the airflow rate from the blower would not only blow water off the user's hands, but also evaporate the water.

To achieve this desired result, one of ordinary skill in the art could easily design a blower with the claimed airflow rate given the plethora of engineering parameters to vary as suggested by Nosenchuck. This myriad of engineering options stemming from (1) Nosenchuck's heat output equation, and (2) express teaching of varying a number of other engineering factors related to the dryer to achieve a desired airflow rate (and therefore "change in kind" of drying) amounts to mere routine experimentation and optimization well within the level of one of ordinary skill in the art.[3]

C. There is Ample Motivation to Utilize the Claimed Airflow Rate in the Cited Prior Art Dryers

Appellant argues that because Gilbertson is used for drying teeth, there would allegedly be no motivation to use the claimed 18,000 fpm airflow rate in view of the possibility of "patient discomfort." (Brief, P. 5.) Notwithstanding that it is unclear what exactly constitutes "patient discomfort" as the term is inherently subjective, the examiner notes that Appellant's argument is, at best, merely speculative. In alleging the possibility of "patient discomfort" at the claimed airflow rate using the Gilbertson dryer, Appellant has offered absolutely no evidence in support of his assertion.

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[3] Cf. In re Huang, 100 F.3d 135, 139 (Fed. Cir. 1996) (holding that invention directed to specific thickness ratios of shock absorbing material amounts to routine experimentation because polyurethane absorbs shock and "one of ordinary skill would logically infer that increasing the amount of the shock absorbing material...would lead to an increase in the amount of shock absorption...[and] one of ordinary skill would have experimented with various thicknesses to obtain an optimum range").

Moreover, Gilbertson's dryer is not limited exclusively to drying teeth as Appellant seems to suggest. Rather, the dryer is intended to be used for areas "where the area to be dried is relatively small." Indeed, Gilbertson cites dentistry applications as an exemplary use--not the sole use. Gilbertson, col. 1, lines 9-18. In fact, Gilbertson's dryer is "useful in many environments." Id. at col. 2, lines 44-47. In any event, the Gilbertson dryer is essentially a hair dryer with a modified nozzle and added filter (col. 1, lines 62-63), and one of ordinary skill in the art could envision a variety of different uses and workpieces to be heated by the dryer's heated airstream.

The Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as whole would suggest to one of ordinary skill in the art. In re McLaughlin, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA 1969). In this case, the teachings of Tomaro (19,000 rpm motor) and Nosenchuck (engineering design choice of various dryer parameters to achieve claimed airflow rate) would be applicable to Gilbertson. Not only is Gilbertson not limited to drying teeth where it may, in fact, be desirable to have an 18,000 fpm airflow rate to accelerate drying, drying of other localized areas would also be enhanced by the enhanced convective heating effect of the claimed airflow rate.

Furthermore, it is well settled that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See In re Casey, 152 USPQ 235 (CCPA 1967) and In re Otto, 136 USPQ 458, 459 (CCPA 1963). Also, a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the apparatus claimed. See Ex parte Masham, 2 USPQ 2d 1647 (1987). Here, the Gilbertson dryer, as well as the secondary references, are capable of performing the intended use--drying the hands. The references are therefore properly cited in the rejections.

D. The Claimed Dimensions of the Air Outlet in Claim 37 In Addition to the Claimed Air Jet Properties of Claims 38-40 Are Not Patentable Over the Combination of Gilbertson, Tomaro, and Nosenchuck.

Appellant argues that the examiner has not shown or suggested certain limitations of claim 37 including the air outlet having (1) a cross-sectional dimension between 0.5 inches to 1.25 inches, and (2) a length 3 to 5 times as large as the outlet cross-sectional dimension. (Brief, P. 5.) But outlet shape and dimensions are the very parameters that are shown by Nosenchuck to be selected by those of ordinary skill in the art to achieve a desired convective heat output.

Nosenchuck states that the air flow envelope of the ducts is "chosen according to known engineering design principles" and that "the exit velocity of the air flow is an important parameter in that regard." Nosenchuck, col. 8, lines 35-38. Once the total

mass flow through the dryer and the exit velocity is determined, Nosenchuck then proceeds to determine the required dimensions of the ducts. Id. at col. 8, lines 42-44. This calculation is further based on the well-known relationship between diameter of the housing and the axial distance along the housing: $d=f(x^{1/3})$, where d is the diameter of the main housing and x is the axial distance along the housing. Id. at col. 8, lines 47-52. Moreover, Nosenchuck states that the profile is "chosen empirically" thereby further suggesting a engineering design choice based on the aforementioned factors.

Furthermore, Nosenchuck states in col. 2, lines 47-54, "[t]he shape of the housing 20 and the outer duct 24, the axial length of the annular duct 68 between them and the variation in area of that annular duct in the axial direction...are all capable of being chosen by those skilled in the art using known principles of aerodynamics and fluid mechanics." It follows that the shape of the housing and the outer duct would necessarily include the dimensions of the housing and the outer duct. Therefore, under Nosenchuck's teaching, the dimensions of the housing and outer duct would be "capable of being chosen by those skilled in the art using known principles of aerodynamics and fluid mechanics." In short, the specific selection of a particular outlet size and length would be within the level of one of ordinary skill in the art in order to achieve a desired airflow rate and convective heating effect upon the workpiece to be heated.

Furthermore, as is well known in the art, outlet sizes of heated air blowers are typically chosen dependent upon the size of the workpiece to be convectively heated. Accordingly, the outlet size is chosen to substantially match the workpiece size. Such an engineering consideration would certainly be apparent to one of ordinary skill in the

art and applicable in the environment of the instant invention given the desirability of maximizing the directing of heated air only on those areas of the workpiece intended to be dried, yet minimizing undesired heating of collateral areas not intended to be dried.

Ultimately, to achieve a desired convective heating effect and intensity on a given workpiece to be heated, the choice of the specific outlet dimensions claimed is merely within the scope of routine experimentation and optimization under Aller. See Part B. supra. Aller applies to the choice of outlet sizes and dimensions for the same reason as noted in connection with the other engineering factors in Part B.--namely to achieve a desired convective heating effect upon the workpiece to be dried.

Similar considerations apply for the characteristics of the air jet claimed in claims 38-40 (i.e., pressure force and temperature values). Because both of these air jet properties merely characterize the intensity of the desired convective heating effect, one of ordinary skill in the art could select the aforementioned engineering factors described by Nosenchuck to achieve the desired convective heating effect and intensity. And, as noted above, the selection of such factors would be merely within the scope of routine experimentation and optimization under Aller.

E. The 37 CFR § 1.132 Declaration Alleging a Long-Felt Need in the Industry for the Invention Does Not Outweigh the Examiner's Prima Facie Case of Obviousness

With regard to the submitted Declaration under 37 C.F.R. § 1.132, the examiner has fully considered the secondary consideration of an apparent long-felt need in the

industry for the instant invention. The examiner appreciates Appellant's comments and has fully considered Appellant's statements and accompanying exhibits.

It is well settled that the weight to be accorded to the evidence of secondary considerations of nonobviousness depends on the individual factual circumstances of each case. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 USPQ 81 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987). Moreover, the ultimate determination on patentability is made on the entire record. In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). Thus, the submission of objective evidence of patentability does not mandate a conclusion of patentability in and of itself. In re Chupp, 816 F.2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987). Facts established by rebuttal evidence must be evaluated along with the facts on which the conclusion of a prima facie case was reached, not against the conclusion itself. In re Eli Lilly, 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990).

Here, based on the preponderance of the evidence, the examiner does not believe the statements advanced in the Declaration, in addition to the accompanying exhibits, outweighs the examiner's prima facie case of obviousness. As noted above and in the Non-final Rejection, the Gilbertson reference, taken in combination with Tomaro and Nosenchuck, provide a powerful suggestion to one of ordinary skill in the art to design a dryer with the claimed characteristics such as airflow rate, dimensions, etc. to achieve a desired convective heating effect.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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February 13, 2003

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